



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.         | CONFIRMATION NO.       |
|---|-------------|----------------------|-----------------------------|------------------------|
| 10/594,006  | 09/25/2006  | Ikuo Takahashi       | 062800-0122                 | 8949                   |
| 23428 7590 05/26/2009<br>FOLEY AND LARDNER LLP<br>SUITE 500<br>3000 K STREET NW<br>WASHINGTON, DC 20007 |             |                      | EXAMINER<br>RAMDHANE, BOBBY |                        |
|   |             |                      | ART UNIT<br>1797            | PAPER NUMBER           |
|   |             |                      | MAIL DATE<br>05/26/2009     | DELIVERY MODE<br>PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/594,006

**Applicant(s)**

TAKAHASHI ET AL.

**Examiner**

BOBBY RAMDHANIE

**Art Unit**

1797

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11, 13, 14, 22, 23, 25, 26, 34, 35 and 37-62 is/are pending in the application.
- 4a) Of the above claim(s) 13, 14, 22, 23, 25, 26, 34, 35 and 37-62 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

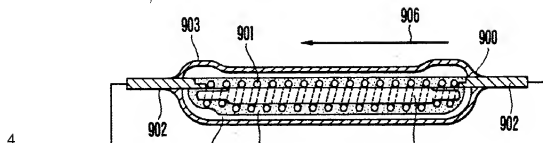
- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftperson's Patent Drawing Review (PTO-848)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 09/25/2006
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

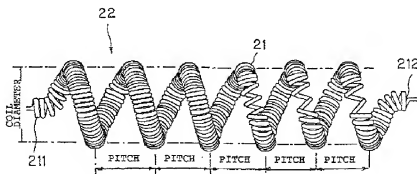
1. Applicant's election with traverse of Group I Claims 1-11 in the reply filed on 03/02/2009 is acknowledged. The traversal is on the ground(s) that JP2001-349861 does not disclose the alleged invention in particular, "wherein the bead portion is constituted of an n-fold coil formed by winding a plain wire into a coil, the plain wire formed with an (n-1)-fold coil that is wound into a coil.
2. This has been found persuasive; the Restriction requirement based on this reference has been withdrawn; however a new restriction requirement with the same Groups I-V, is made based on the prior art of record: US5138221 and US6465949.
3. US5138221 (Please see Figure 9 below) discloses the heater coil for a gas sensor used in a catalytic combustion gas sensor, comprising: A). A bead portion of which an electrical characteristic value is varied by combustion heat generated when a gas is burned (See Item 901); and B). Lead portions extending from both ends of the bead portion (See Item 902), wherein the bead portion is constituted of an n-fold coil formed by winding a plain wire into a coil, the plain wire formed with an (n-1)-fold coil that is wound into a coil, where n is an integer equal to or larger than two (See Example 5 which is made by the same process of Examples 1& 2. The platinum wire is a metallic wire coil which is then wound round a Mo core; Column 6 lines 66-68).

**FIG. 9**



5. US6465949 discloses the heater coil (Please See Figure 2b below) for a gas sensor used in a catalytic combustion gas sensor, comprising: A). A bead portion of which an electrical characteristic value is varied by combustion heat generated when a gas is burned (See Item 21); and B). Lead portions extending from both ends of the bead portion (See Items 211 & 212), wherein the bead portion is constituted of an  $n$ -fold coil formed by winding a plain wire into a coil, the plain wire formed with an  $(n-1)$ -fold coil that is wound into a coil, where  $n$  is an integer equal to or larger than two (Please See 2b).

**FIG. 2(b)**



The requirement is still deemed proper and is therefore made FINAL.

***Specification***

6. The abstract of the disclosure is objected to because the Claims are explicitly referred to throughout the Specification. Correction is required. See MPEP § 608.01(b). The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1 & 3-11 are rejected under 35 U.S.C. 102(b) as being anticipated by ARATO ET AL (US 5,138,221).

9. Applicants' claims are toward a device.

10. Regarding Claims 1 & 3-11, ARATO ET AL discloses the heater coil for a gas sensor used in a catalytic combustion gas sensor (See Figure 9), comprising: A). A bead portion of which an electrical characteristic value is varied by combustion heat generated when a gas is burned (See Item 901); and B). Lead portions extending from both ends of the bead portion (See Item 902), wherein the bead portion is constituted of an n-fold coil formed by winding a plain wire into a coil, the plain wire formed with an (n-

1)-fold coil that is wound into a coil, where n is an integer equal to or larger than two (See Example 5 which is made by the same process of Examples 1 & 2. The platinum wire is a metallic wire coil which is then wound round a Mo core; Column 6 lines 66-68).

11. Additional Disclosures Included: Claim 3: The heater for a gas sensor according to claim 1, wherein a wire diameter of a non-coiled raw wire that is a starting material is equal to or larger than 1  $\mu\text{m}$  and equal to or smaller than 100  $\mu\text{m}$  (See Example 5; diameter of platinum wire is 30  $\mu\text{m}$ ); Claim 4: Wherein a wire diameter of a non-coiled raw wire that is a starting material is equal to or larger than 10  $\mu\text{m}$  and equal to or smaller than 50  $\mu\text{m}$  (See Example 5; diameter of platinum wire is 30  $\mu\text{m}$ ); Claim 5: Wherein a wire diameter of a non-coiled raw wire that is a starting material is equal to or larger than 20  $\mu\text{m}$  and equal to or smaller than 30  $\mu\text{m}$  (See Example 5; diameter of platinum wire is 30  $\mu\text{m}$ ); Claim 6: Wherein a winding diameter of an m-fold coil is equal to or larger than 0.5 times and equal to or smaller than 20 times as large as a diameter of a core metal used for winding into a coil when the m-fold coil is manufactured, where m is an integer equal to or larger than one and equal to or smaller than n (See Example 5 in view of Examples 1 & 2 Platinum wire is 30  $\mu\text{m}$  and the Mo core is 150  $\mu\text{m}$ ); Claim 7: Wherein a winding diameter of an m-fold coil is equal to or larger than 1 time and equal to or smaller than 10 times as large as a diameter of a core metal used for winding into a coil when the m-fold coil is manufactured, where m is an integer equal to or larger than one and equal to or smaller than n (See Example 5 in view of Examples 1 & 2 Platinum wire is 30  $\mu\text{m}$  and the Mo core is 150  $\mu\text{m}$ ); Claim 8: Wherein number of

turns of the n-fold coil is equal to or larger than 1 and equal to or smaller than 30 (See Figure 9); Claim 9: Wherein, length of a gap between a wound portion of a k-th turn and a wound portion of a (k+1)-th turn in the n-fold coil is equal to or larger than 0.5 times and equal to or smaller than 10 times as large as a diameter of the plain wire formed by the (n-1)-fold coil, where k is an integer equal to or larger than one (See Figure 9; the coil is wound as disclosed in Examples 1 & 2); Claim 10: Wherein the heater coil is constituted of a wire material made of platinum (See Example 5; platinum); and Claim 11: Wherein the heater coil is constituted of a wire material made of platinum based alloy (See Example 5; the lead wires are Pt-Ir alloy).

12. Claims 1, 2, & 8 are rejected under 35 U.S.C. 102(b) as being anticipated by MIAHARA ET AL (US 6,465,949).

13. Applicants' claims are toward a device.

14. Regarding Claims 1, 2, & 8, MIAHARA ET AL discloses the heater coil (Please See Figure 2b below) for a gas sensor used in a catalytic combustion gas sensor, comprising: A). A bead portion of which an electrical characteristic value is varied by combustion heat generated when a gas is burned (See Item 21); and B). Lead portions extending from both ends of the bead portion (See Items 211 & 212), wherein the bead portion is constituted of an n-fold coil formed by winding a plain wire into a coil, the plain wire formed with an (n-1)-fold coil that is wound into a coil, where n is an integer equal to or larger than two (Please See 2b).

15. Additional Disclosures Included: Claim 2: Wherein the lead portions are constituted of an (n-1)-fold coil (See Figure 2b; Items 211& 212); and Claim 8: Wherein number of turns of the n-fold coil is equal to or larger than 1 and equal to or smaller than 30 (See Column 3 lines 19-21);

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over ARATO ET AL and/or in view of MIAHARA ET AL.

19. Applicants' claim is toward a device.

20. Regarding Claim 2, ARATO ET AL discloses the heater coil for a gas sensor according to Claim 1, except wherein the lead portions are constituted of an (n-1)-fold coil. ARATO ET AL does however disclose that the Prior art discloses that the heater



coil for cathode ray tubes possess (n-1) fold coils at the lead portions of the bead portion (See Figure 1). ARATO ET AL also discloses the heater coil is capable of being used in gas sensors and illumination devices such as cathode ray tubes (See Abstract).

21. MIAHARA ET AL discloses a heater coil in which the lead portions are constituted of an (n-1) fold coil (See Figure 2b).

22. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the heater coil for the gas sensor of ARATO ET AL with the (n-1) fold coil lead portions of the Prior Art and/or MIAHARA ET AL to reduce the number of electrical connections are needed.

#### ***Telephonic Inquiries***

23. The Examiner would like to note that SHO 61-082659 also discloses the heater coil; double coil wire as shown in Figure 2. The lead portions are also shown to be of a double coil. JP 01-050253 also discloses a double coil wire as recited in at least Claim 1.

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BOBBY RAMDHANIE whose telephone number is (571)270-3240. The examiner can normally be reached on Mon-Fri 8-5 (Alt Fri off).

25. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. R./

/Walter D. Griffin/  
Supervisory Patent Examiner, Art Unit 1797